

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

These amendments introduce no new matter and support for the amendment is replete throughout the specification and claims as originally filed. These amendments are made without prejudice and are not to be construed as abandonment of the previously claimed subject matter, or agreement with any objection or rejection of record.

Listing of Claims:

Claims 1-72 (canceled)

73. (New) A cell-based assay method comprising:

flowing a suspension of cells in a microchannel;

flowing a dye into the resulting flowing cell suspension, thereby contacting the cells and the dye;

incubating the cells and the dye in the microchannel for a time period sufficient for association of the dye with a plurality of the cells in the cell suspension; and,
monitoring a detectable signal from the dye after association with the cells.

74. (New) The method of claim 72, wherein said flowing comprises: electroosmotic flow or pressure-based flow.

75. (New) The method of claim 72, wherein the microchannel comprises a microfluidic device.

76. (New) The method of claim 72, wherein the cells are selected from the group consisting of: bacteria, plant cells, animal cells, fungi, yeast, cardiac cells, and nerve cells.

77. (New) The method of claim 72, wherein said flowing a dye comprises introduction of the dye into the microchannel through a side channel intersection.

78. (New) The method of claim 72, wherein a time from contact of the cells and the dye to said detecting comprises about 100 seconds or less.

79. (New) The method of claim 72, wherein the time from contact of the cells and the dye to said detecting ranges from about 75 seconds to about 10 seconds.

80. (New) The method of claim 72, wherein the association of the dye with a plurality of the cells comprises dye uptake by the cells.

81. (New) The method of claim 72, wherein the cell suspension comprises from about 200 cells to about 50 cells.

82. (New) The method of claim 72, wherein the dye is selected from the group consisting of: a fluorescent dye, a cation indicating dye, a calcium indicating dye, a membrane potential indicating dye, and a Nernstian dye.

83. (New) The method of claim 72, further comprising contacting the cell suspension with a modulatory composition.

84. (New) The method of claim 82, wherein the modulatory composition is selected from the group consisting of: a neurotoxin, a neurotransmitter, a protein, a peptide, a lipid, a carbohydrate, an organic molecule, a drug, a receptor ligand, an antibody, a cytokine, a chemokine, a hormone, and a cell.

85. (New) The method of claim 82, wherein the detectable signal comprises detecting a change in the dye associated with a cell response to the modulatory composition, wherein the change in the dye is selected from the group comprising: a changed fluorescence, a changed light absorbance, and a change in a luminesce.

86. (New) The method of claim 84, wherein the cell response is selected from the group consisting of: a changed cation concentration, a changed membrane potential, and a changed calcium ion concentration.